Use of formalin-fixed and paraffin-embedded tissues for diagnosis and therapy in routine clinical settings.

Abstract: Formalin-fixed and paraffin-embedded (FFPE) tissues are used routinely everyday in hospitals world-wide for histopathological diagnosis of diseases like cancer. Due to formalin-induced cross-linking of proteins, FFPE tissues present a particular challenge for proteomic analysis. Nevertheless, there has been recent progress for extraction-based protein analysis in these tissues. Novel tools developed in the last few years are urgently needed because precise protein biomarker quantification in clinical FFPE tissues will be crucial for treatment decisions and to assess success or failure of current and future personalized molecular therapies. Furthermore, they will help to conceive why only a subset of patients responds to individualized treatments. Reverse phase protein array (RPPA) is a very promising new technology for quick and simultaneous analysis of many patient samples allowing relative and absolute protein quantifications. In this chapter, we show how protein extraction from FFPE tissues might facilitate the implementation of RPPA for therapy decisions and discuss challenges for application of RPPA in clinical trials and routine settings.